IRA A. FULTON SCHOOLS
OF ENGINEERING

Entrepreneurship
WE WILL ACCELERATE REAL-WORLD SOLUTIONS FROM CONCEPTION TO IMPACT, ASSUMING A FUNDAMENTAL RESPONSIBILITY FOR ADVANCING THE ECONOMIC, SOCIAL, AND CULTURAL HEALTH OF OUR REGION AND OUR PLANET

TOGETHER, OUR POTENTIAL IS LIMITLESS

At the Ira A. Fulton Schools of Engineering, we believe that engineering is more than a discipline—it's a mind-set, a way of looking at the world to determine how challenges can be met most efficiently, sustainably, safely, and in cost-effective ways that maximize impact and benefit those we serve. As an entrepreneurial engine, our 20,000-plus diverse students and faculty are accelerating big ideas to practical realities so that our region and the world can benefit now from the solutions we engineer.
In the Fulton Schools of Engineering, simply put, we build engineers and innovators. The demand for well-prepared engineers, builders, makers, designers, and innovators continues to grow. Our highly regarded graduates are actively recruited by top companies; many go on to pursue graduate studies in medicine, law, engineering, and science; and still others make their mark through service-based experiences, such as the Peace Corps or Teach for America. We give students the individual attention they need to succeed so we can graduate the engineers—and problem solvers—who advance the well-being of our communities, state, and nation.

Our vision of engineering is “the Fulton Difference,” and it encapsulates these principles:

- **We think outside the classroom and focus on student success.** E2, our innovative program to welcome new freshmen—together with personalized advising, residential communities, engineering tutoring services, and our dedicated career center—is just the beginning of our commitment to student success.

600 students participate in entrepreneurial activities and classes.
We motivate our students to take advantage of the many opportunities available to develop their unique talents for research, curiosity for global understanding, and development of an entrepreneurial mind-set.

- **We conduct use-inspired research**, taking on the great challenges of our time, advancing fundamental discovery, and addressing engineering challenges over a vast array of critical applications. Our faculty and students understand and value the important impact their research has on discovery of solutions and promotion of the economic, social, and cultural health of our planet.

- **We engage our stakeholders**, corporate partners, alumni, and region in advancing ideas for connecting our engineers across a broad spectrum, through career opportunities for our students to industry-driven projects for our faculty. Our alumni are critical to our success through not only their philanthropic support but also their many contributions to and personal involvement with the advancement of our ideas. The Fulton Schools of Engineering understand, and embrace, our obligation to the economic vitality of our region through the workforce that we develop and train and the research advances of our faculty.

- **We attract faculty dedicated to transforming engineering education and research**. Our faculty embrace change, provide inspiration to our students, and measure the success of their research and professional activities by the impact they have locally and globally. Our faculty include a Nobel Laureate and members of the prestigious National Academy of Engineering, National Academy of Sciences, National Academy of Inventors, and National Academy of Construction.

**OUR DONORS’ IMPACT**

The support of friends like you has helped place the Ira A. Fulton Schools of Engineering among the top 10 universities in the country for licenses and options, start-ups, and invention disclosures per $10 million in research expenditures. Our record 161 invention disclosures in fiscal year 2015 accounted for 60 percent of the university’s total output. Clearly, our faculty and students are engineering big ideas.

Now is the time to build on this foundation of success and become a place known for our entrepreneurial mind-set, supporting and catalyzing ideas into the global marketplace, where they can have a real-world impact, driving our regional economy and changing lives. Through Campaign ASU 2020, you can facilitate today’s entrepreneurial process and help educate tomorrow’s entrepreneurs.
Our knowledge-based economy depends on well-educated and highly trained technical professionals with a strong entrepreneurial mind-set who will maintain our country’s competitive edge and will be the key to evolving the nation’s economy. Ranked as the most innovative university in the country by U.S. News & World Report two years in a row, ASU and the Fulton Schools of Engineering are working to build a robust pipeline of innovative professionals and entrepreneurs through advances in education platforms.

INNOVATION IN THE RESEARCH LAB
Funding to establish and grow research labs is a critical priority. Despite state-of-the-art research facilities across the Tempe and Polytechnic campuses that advance far-reaching, use-inspired research agendas, every time we add a faculty member, we need additional cutting-edge lab space.

Today, our faculty are working on rehabilitation robots, methods of construction that reduce the impact of earthquakes on buildings, and advances in wireless communications—any of which could be one of tomorrow’s life-changing discoveries. Named labs create lasting legacies and are needed to advance the development of new knowledge by world-class researchers.

In addition to research centers and individual faculty labs, each undergraduate program has corresponding teaching labs. Naming funds and other donations can build and finance state-of-the-art equipment, facilitate collaboration, and, as a result, enable greater productivity among
Cody Friesen’s alternative research team set out to create an energy-storage breakthrough that would dramatically reduce costs and eliminate toxic and rare metals in batteries. Team members discovered a way to make zinc-air batteries rechargeable—a solution that launched Fluidic Energy, Inc., as a private company now set to bring reliable power to 500 remote Indonesian islands.

The “500 Island Project,” one of the largest rural electrification projects in the world, will employ Fluidic’s unique sustainable-energy system to provide electricity to 1.7 million people in 325,000 households. Fluidic is carrying out the project in partnership with Caterpillar, Inc., and PT Perusahaan Listrik Negara, Indonesia’s state-owned electric company.

The micro-grid network is “much smarter” than those currently in use, explains Friesen, an associate professor of materials science. “It’s a stand-alone system, which makes it ideal in remote locations like the islands of Indonesia. We use solar technology to recharge the batteries, and we’ve eliminated the toxins associated with diesel generators and lead.”

More important, the system is reliable. “It can withstand hot climates and heavy usage loads without the deterioration you find in lead-based batteries or the high costs associated with diesel,” Friesen emphasizes. “When you are on a remote island, you can’t just plug into a larger power grid.”

After completing his doctorate at MIT in 2004, Friesen was intrigued by “some interesting things” happening at ASU, where he’d earned his bachelor’s degree in materials science and engineering in 2000.

“President Michael Crow was talking about shaking up the academic model to go solve big world problems,” he points out. “ASU was creating new models for expanding academic impact into the marketplace.”

So Friesen joined the faculty, and his research led to a new company . . . and reliable power for 500 Indonesian islands.
undergraduate and graduate students who are tackling projects that range from aerodynamics to electric circuit design.

Our goal is to raise $10 million to advance faculty and students with state-of-the-art research equipment labs and facilities.

SPEEDING TECHNOLOGY TRANSFER
Advances in technology, high-tech, and innovation industries stimulate the regional economy through technology advancements and job creation. Together with industry, government, and other strategic partners, the Fulton Schools are working to accelerate the transformation of the Greater Phoenix economy into a global force for innovation by quickly translating scientific discovery to the marketplace. In order to raise the region's profile and reputation as a leading technology innovator, the Fulton Schools of Engineering will establish Innovation Collaboratories focused on areas of research excellence and industry strength, enabling the Fulton Schools to scale their research enterprise. These interdisciplinary collaboratories will foster advancements in manufacturing, STEM education, cybersecurity, advanced communication, rehabilitation and robotics, renewable energy, and sustainability.

Accordingly, the collaboratories will serve as a use-inspired research and technology development model that will:

- Capitalize on the Fulton Schools’ talent-rich faculty and student body at scale.
- Focus on research initiatives that represent areas of strength and opportunity for the region.
- Accelerate the pace of knowledge creation and invention in critical areas.
Build a highly skilled workforce tailor-made for local industry.

Expand capacity to produce discoveries of fundamental value.

Create a technology incubator that will shorten the lead time required to take technology from development to the marketplace through promotion of licensing, patent application, and start-up nurturing.

Provide early-stage seed funding for qualified projects, ensuring that technologies with a potential for high impact safely transition to the marketplace.

Our goal is to raise $25 million to advance these transformational partnerships and areas of expertise, creating an unparalleled economic engine for the state and region.

SPARKING STUDENT ENTREPRENEURSHIP

The game-changing entrepreneurial efforts of our students are seeded within the Fulton Schools of Engineering from freshman year through graduation and include such programs as Engineering Projects in Community Service (EPICS), the eSeed Challenge, FSE 100 Introduction to Engineering labs, the Grand Challenge Scholars Program, the Polytechnic School’s Technological Entrepreneurship and Management program, and applied learning/project courses and capstone classes—all of which depend on external funding support.

Students envision the innovative solutions, but support programs provide the education, skills, mind-set, and experience needed for them to succeed as entrepreneurs. As a part of our commitment to student success, we recently launched the Fulton Schools Startup Center to empower all undergraduate and graduate students to advance their entrepreneurial ideas. With endowed funds of $10 million for our entrepreneurial programs, the Fulton Schools can reach the university’s goal of having 10 percent of engineering students engaged in entrepreneurial efforts.

Beyond programmatic investment, the Fulton Schools partner with private donors to provide seed funding to advance student solutions and entrepreneurial activities. In just one example, a donor has invested annual seed funding of $100,000, with funds going directly toward student companies. With endowed funds of $5 million, donors have the opportunity to support the center’s annual needs for advancing student entrepreneurs and their ideas.
“WE HAVE GREAT POTENTIAL TO STIMULATE ECONOMIC DEVELOPMENT IN SCIENCE AND TECHNOLOGY ACROSS THE PHOENIX METRO AREA BY QUICKLY TRANSLATING SCIENTIFIC DISCOVERY INTO PRACTICE. WE WILL CONTINUE TO ADVANCE THE ENTREPRENEURIAL MIND-SET THAT THRIVES AMONG OUR STUDENTS AND OUR FACULTY.”

—Kyle Squires, Dean, Ira A. Fulton Schools of Engineering

JOIN US IN DRIVING THE REGION’S ECONOMY

The Greater Phoenix region’s strength in advanced industries, including semiconductors and electronics, navigational instruments and sensors, and aerospace and defense, contributes significantly to the state’s competitiveness in the global marketplace. However, overreliance on growth-dependent industries, including real estate, retail labor, construction, and hospitality services, leaves our economy vulnerable to market fluctuation and has contributed to indicators that persistently rank below national averages. It is clear that in order to secure prosperity for its citizens, our region must transition from a growth-dependent economy to one that is agile, flexible, and driven by technological innovation.

The Ira A. Fulton Schools of Engineering are ready to lead that transition. With your help, we will build on our proven record of development in intellectual property to create world-changing solutions—and then put those solutions into action.

There has never been a greater opportunity for you to make a difference. Your generosity can have immediate, real-world impact far beyond campus. By supporting Campaign ASU 2020, you advance your own personal vision for the Ira A. Fulton Schools of Engineering and our positive impact on the region’s economy and beyond.
27 spinouts

685 invention disclosures from '12-'16
With your generous support, Arizona State University has reinvented the public research university. We are both more inclusive and more accomplished than ever, with ASU students and faculty earning unprecedented levels of recognition for their achievements. Our graduates leave here as master learners who are capable of rising to meet any new and unfamiliar challenge. ASU students, faculty, and graduates also are firmly rooted in their communities and committed to advancing the common good. Together, we have created a model for other universities to follow. Your support during Campaign ASU 2020 will help us break more new ground by raising $1.5 billion to propel our vision for higher education into the next decade and beyond.

ARIZONA STATE UNIVERSITY is a comprehensive public research university, measured not by whom we exclude, but rather by whom we include and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural, and overall health of the communities it serves.